

Remarks

Rejections Under 35 U.S.C. § 102(b)

The Examiner has rejected claims 1-2, 6-7, 31-35, and 39-43 as anticipated under 35 U.S.C. § 102(b) by United States patent number 6,438,004 issued to Tanaka (hereinafter referred to as Tanaka). The Applicant respectfully requests the Examiner's careful consideration of the explanations provided below regarding the rejections of these claims.

Rejections of claims 1-6 Under 35 U.S.C. § 102(b)

Claim 1 includes the limitations of "a biasing snubber circuit coupled to the switching circuit and the control circuit to capture energy from a circuit switched by the switching circuit and **to provide at least a portion of the captured energy to bias the control circuit**". (emphasis added) In item 2 on page 3 of the Examiner's office action, the Examiner seems to be asserting that the limitation of claim 1 of "switching circuit" reads upon "main switches Q1, Q2" "first auxiliary switch Q5", third auxiliary switch Q6", "second auxiliary switch Q3", and "fourth auxiliary switch Q4" of Tanaka. Additionally, in this section of the office action, the Examiner seems to be asserting that the limitations of "biasing snubber circuit" read upon subject matter disclosed in column 3, lines 5-55 of Tanaka. Specifically, the Applicant infers that the Examiner is asserting that the limitation of "biasing snubber circuit" reads upon, for example, "a main-switch snubber capacitor connected in parallel with each of the main switches". Furthermore, the Examiner seems to be asserting that the limitation of "control circuit" reads upon the element in Figure 1 labeled "Control Circuit".

The Applicant respectfully submits that subject matter upon which the limitations of claim 1 recited above read is not disclosed in Tanaka. The Applicant respectfully submits that the sections of Tanaka cited by the Examiner on page 3, item 2 of the office action do not disclose that "a main-switch snubber capacitor connected in parallel with each of the main switches" is configured "to provide at least a portion of the captured energy to bias" the "Control Circuit" of

200309715-1

12

SN 10/780,927
Response B

Figure 1 of Tanaka. The Applicant directs the Examiner's attention to column 15, line 45 through column 16, line 38 that discloses:

In FIG. 14, V_g indicates a driving signal for the switches. First, given that the main switch Q1 is in ON-state. When the main switch Q1 is turned off, the main switch starts the commutation of the load current. However, when the load current is less than the threshold $I_{sub.th}$, it takes time to commute due to the snubber capacitor connected in parallel with the main switch, and thereby the main switch can be turned on with leaving voltage in the snubber capacitor. This causes a short-circuit loss because the accumulated energy in the capacitor is consumed by the main switch. In order to prevent this, the fourth and sixth auxiliary switches Q4, Q6 are turned on in conjunction with the turn-on of the main switch Q1 at the time $T_{sub.0}$ in the waveform shown in FIG. 14. ***Then, resonance is caused by the resonant inductor L1 and the snubber capacitors C1, C2. By this resonance, the voltage across the main switch Q2 is reduced, and goes down to zero at the time $T_{sub.1}$. Simultaneously, the resonant current I_r is refluxed along the path through the auxiliary switch Q4, the auxiliary switch Q6 and the diode D2.*** The "zero-voltage turn-on" can be achieved by turning on the main switch Q2 on and after the time $T_{sub.1}$. Further, when the auxiliary switch Q4 is turned off on and after the time $T_{sub.1}$, ***diodes D3, D5 are brought into conduction by the current I_r of the resonant inductor L1. Thus, the excited energy in the resonant inductor L1 is regeneratively returned to the input $V_{sub.in}$, and the regeneration is completed at the time $T_{sub.2}$. The above control prevents any short-circuit loss in light load current otherwise caused by the snubber capacitor.*** This control process is performed by voltage detection without detecting current. Thus, the detecting circuit can be simplified.

Referring to FIG. 15, V_g indicates a driving signal of the switches. At first, given that the main switch Q2 is in ON-state. When the main switch Q2 is turned off, the main switch starts to commute by the load current. However, when the load current is less than the threshold $I_{sub.th}$, it takes time to the commutation due to the snubber capacitor connected in parallel with the main switch, and thereby the main switch can be turned on with leaving voltage in the snubber capacitor. This causes a short-circuit loss because the accumulated energy in the capacitor is consumed by the main switch. In order to prevent this, the third and fifth auxiliary switches Q3, Q5 are turned in conjunction with the turn-off of the main switch Q2 at the time $T_{sub.0}$ in the waveform shown in FIG. 15. ***Then,***

200309715-1

13

SN 10/780,927
Response B

resonance is caused by the resonant inductor L1 and the snubber capacitors C1, C2. By this resonance, the voltage across the main switch Q1 is reduced, and goes down to zero at the time T.sub.1. Simultaneously, the resonant current Ir is refluxed along the path through the auxiliary switches Q3, Q5 and the diode D1. By turning on the main switch Q1 on and after the time T.sub.1, the zero-voltage turn-on can be achieved. When the auxiliary switch Q3 is turned off on and after the time T.sub.1, the diodes D4, D6 are brought into conduction by the current Ir of the resonant inductor L1. Then, the excited energy in the resonant inductor L1 is regeneratively returned to the input V.sub.in, and the regeneration is completed at the time T.sub.2. The above control can prevent any short-circuit loss in light load current otherwise caused by the snubber capacitor. This control process can provide the same effect as that of the control in FIG. 14. (emphasis added)

Thus, as can be determined from the above cited section of Tanaka, "energy in the resonant inductor L1" is "returned to the input" V_{in} . In contrast, the limitations of claim 1 recite "to provide at least a portion of the captured energy to bias the control circuit". As can be seen from Figure 1 of Tanaka, V_{in} and "Control Circuit" are different. Therefore, Tanaka does not disclose subject matter upon which all of the limitations of claim 1 read.

As the Applicant knows that the Examiner is certainly aware, MPEP 2131 requires that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference". Because the sections of Tanaka relied upon in making the rejection of claim 1 do not disclose subject matter upon which every limitation of claim 1 reads, a valid prima facie anticipation rejection of claim 1 with respect to Tanaka is not present for at least this reason. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(b).

Claims 2, 6, and 7 are dependent, either directly or indirectly, upon claim 1 and therefore incorporate all the limitations of claim 1. For at least the reason that a valid prima facie anticipation rejection of claim 1 is not present with respect to Tanaka, a valid prima facie anticipation rejection of claims 2, 6, and 7 is not present with respect to Tanaka. Accordingly, the Applicants respectfully request

withdrawal of the rejections of claims 2, 6, and 7 under 35 U.S.C. § 102(b).

Rejections of claims 31-35 Under 35 U.S.C. § 102(b)

The amended claim 31 includes the limitations of "a second energy storage device coupled to the first energy storage device to store the captured energy **and to provide at least a portion of the captured energy to a control circuit**". (emphasis added) As explained in detail with respect to the rejection of claim 1, the Applicant submits that subject matter upon which these limitations read is not disclosed in the sections of Tanaka relied upon by the Examiner in making the rejection of claim 31.

Because the sections of Tanaka relied upon in making the rejection of claim 31 do not disclose subject matter upon which every limitation of the amended claim 31 reads, a valid prima facie anticipation rejection of the amended claim 31 with respect to Tanaka is not present for at least this reason. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claim 31 under 35 U.S.C. § 102(b).

Claims 32-35 are dependent upon the amended claim 31 and therefore incorporate all the limitations of the amended claim 31. For at least the reason that a valid prima facie anticipation rejection of the amended claim 31 is not present with respect to Tanaka, a valid prima facie anticipation rejection of claims 32-35 is not present with respect to Tanaka. Accordingly, the Applicants respectfully request withdrawal of the rejections of claims 32-35 under 35 U.S.C. § 102(b).

Rejections of claims 39-42 Under 35 U.S.C. § 102(b)

The amended claim 39 includes the limitations of "providing at least a portion of energy stored on the second energy storage device **to power the control circuit**". (emphasis added) As explained in detail with respect to the rejection of claim 1, the Applicant submits that subject matter upon which these limitations read is not disclosed in the sections of Tanaka relied upon by the Examiner in making the rejection of claim 39.

200309715-1

15

SN 10/780,927
Response B

Because the sections of Tanaka relied upon in making the rejection of claim 39 do not disclose subject matter upon which every limitation of the amended claim 39 reads, a valid prima facie anticipation rejection of the amended claim 39 with respect to Tanaka is not present for at least this reason. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claim 39 under 35 U.S.C. § 102(b).

Claims 40-42 are dependent upon the amended claim 39 and therefore incorporate all the limitations of the amended claim 39. For at least the reason that a valid prima facie anticipation rejection of the amended claim 39 is not present with respect to Tanaka, a valid prima facie anticipation rejection of claims 40-42 is not present with respect to Tanaka. Accordingly, the Applicants respectfully request withdrawal of the rejections of claims 40-42 under 35 U.S.C. § 102(b).

Rejection of Claim 43 Under 35 U.S.C. § 102(b)

The Applicant notes that MPEP section 2181, discussing when to apply 35 U.S.C. § 112, sixth paragraph, requires that:

A claim limitation *will be* interpreted to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

- (A) the claim limitations must use the phrase "**means for**" or "step for;"
- (B) the "means for" or "step for" **must be modified by functional language**; and
- (C) the phrase "means for" or "step for" must not be modified by sufficient structure, material or acts for achieving the specified function. (emphasis added)

The Applicant respectfully submits to the Examiner that, according to the MPEP 2181 procedure, claim 43 must be examined according to the procedure associated with 35 U.S.C. § 112, sixth paragraph.

The Applicant further notes that MPEP 2183, in discussing the procedure for establishing a prima facie case of equivalence, requires that:

200309715-1

16

SN 10/780,927
Response B

If the examiner finds that a prior art element
(A) performs the function specified in the claim,
(B) is not excluded by any explicit definition provided in the
specification for an equivalent, and
(C) is an equivalent of the means- (or step-) plus-function limitation,
***the examiner should provide an explanation and rationale in
the Office action as to why the prior art element is an
equivalent.*** (emphasis added)

The Applicants could find no such analysis in the Examiner's office action. Therefore, it appears that the Examiner has not followed the requirements detailed in MPEP 2183 to properly establish a prima facie case of equivalence and hence a valid prima facie rejection of claim 43 has not been made. The Applicants respectfully request that the Examiner provide this analysis according to the MPEP 2183 in a non-final office action if the Examiner maintains the rejection of claim 43 as anticipated by Tanaka so that the Applicants can make an assessment of the propriety of the Examiner's rejection of claim 43.

Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 3-5, 17-20, 35-38, and 44-45 as obvious under 35 U.S.C. § 103(a) over Tanaka in view of what the Examiner contends is "within the general skill of a worker in the art" "since it has been held to be within the general skill of a worker in the art to select a known topology on the basis of its suitability for the intended use a matter of obvious design choice". The Applicant respectfully requests the Examiner's careful consideration of the explanations provided below regarding the rejections of these claims.

Rejections of Claims 3-5 and 17-20 Under 35 U.S.C. § 103(a)

As the Examiner is well aware, according to MPEP 2143 "[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. ***Finally, the prior art reference (or***

200309715-1

17

SN 10/780,927
Response B

references when combined) must teach or suggest all the claim limitations." (emphasis added)

The Applicant respectfully submits for at least the reason that claims 3-5 and 17-20 incorporate limitations of claim 1 for which, as explained in detail above, subject matter is not disclosed in the cited sections of Tanaka upon which these limitations read, a valid prima facie obviousness rejection of claims 3-5 and 17-20 is not present. Accordingly, the Applicant respectfully requests the Examiner to withdraw the rejections of claims 3-5 and 17-20 under 35 U.S.C. § 103(a).

Furthermore, the Applicant does not concede that the apparatuses formed by combining the limitations recited in claims 3-5 and 17-20 with the limitations of the claims from which they depend are obvious in view of the prior art. The Applicant respectfully requests that the Examiner make a valid prima facie obviousness rejection of claims 3-5 and 17-20 based upon properly combinable references disclosing subject matter upon which all of the limitations of claims 3-5 and 17-20 read according to the requirements of MPEP 2143.

Rejections of Claims 35-38 Under 35 U.S.C. § 103(a)

The Applicant respectfully submits that for at least the reason that claims 35-38 incorporate limitations of claim 31 for which, as explained in detail above, subject matter, upon which these limitations read, is not disclosed in the cited sections of Tanaka, a valid prima facie obviousness rejection of claims 35-38 is not present. Accordingly, the Applicant respectfully requests the Examiner to withdraw the rejections of claims 35-38 under 35 U.S.C. § 103(a).

Furthermore, the Applicant does not concede that the snubber circuits formed by combining the limitations recited in claims 35-38 with the limitations of the claims from which they depend are obvious in view of the prior art. The Applicant respectfully requests that the Examiner make a valid prima facie obviousness rejection of claims 35-38 based upon properly combinable references disclosing subject matter upon which all of the limitations of claims 35-38 read according to the requirements of MPEP 2143 or withdraw the

rejections of claims 35-38 under 35 U.S.C. § 103(a).

Rejections of Claims 44-45 Under 35 U.S.C. § 103(a)

Claims 44-45 are dependent from claim 43 and therefore incorporate all the limitations of claim 43. The Applicant respectfully submits that for at least the reason that the Examiner has not established a valid prima facie anticipation rejection of claim 43 through the procedure specified in MPEP 2183 to make a showing of equivalence, a valid prima facie obviousness rejection of claims 44-45, which are dependent upon claim 43, is not present.


Furthermore, the Applicant does not concede that the snubber circuits formed by combining the limitations recited in claims 44-45 with the limitations of the claims from which they depend are obvious in view of the prior art. The Applicant respectfully requests that the Examiner make a valid prima facie obviousness rejection of claims 35-38 based upon properly combinable references disclosing subject matter upon which all of the limitations of claims 35-38 read according to the requirements of MPEP 2143 or withdraw the rejections of claims 35-38 under 35 U.S.C. § 103(a).

Conclusion

The Applicant respectfully contends that the subject application is in a condition for allowance. Allowance is respectfully requested.

Respectfully submitted,

B. Mark Hirst

By 

Gregg W. Wisdom

Reg. No. 40,231

May 24, 2006

(360) 212-8052

200309715-1

19

SN 10/780,927
Response B